

reaching a velocity of 40 miles an hour about 9:30 p. m., with an unusually heavy downpour of hail from 9:31 to 9:36 p. m., covering the ground like a blanket of snow. Some of the hailstones were from one-half to 1 inch in diameter. In places corn and vegetation were stripped of blades and leaves, cotton was beaten into the ground, and fruit and other trees damaged. One person was killed by lightning near Terrell, Tex., and crops and property damage was estimated at over \$50,000.

Alabama.—A severe storm occurred shortly after midnight of May 21–22, 1916, about 6 miles south-southwest of Birmingham, Ala. Several mining camps with the homes of the employees were in the direct path of the storm, which was about 500 feet wide and a mile in length. The first damage was the blowing over of three steel towers bearing high-tension wires. At one of the camps (Spring Gap) one house was destroyed and its three occupants (a woman and two children) were killed. Several other houses were blown so that they leaned from 15 to 20° in a northwesterly direction, but retained their foundation positions. Boards, pieces of tin, and other loose material were carried several hundred yards to the northwest, and many trees were blown over, about half the latter being snapped off a few feet above the ground. Besides the three people killed several were injured, one severely. Property loss was about \$15,000.

South Carolina.—A severe storm visited Charleston, S. C., on the afternoon of May 30, 1916. All wreckage fell in one direction, which indicates it was not a tornado. The storm traveled from west to east, and was about 150 yards wide and less than one-half mile in length. The property damage was slight, being confined principally to the demolition of some advertising signs, the blowing over of a few chimneys, and wrecking a portion of the roof of the Union Station. One man was struck and killed by an advertising sign behind which he had apparently taken refuge, and a boy was seriously injured in the same way.

Average accumulated departures for May, 1916.

Districts.	Temperature.			Precipitation.			Cloudiness.		Relative humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	° F.	° F.	° F.	Inch.	Inch.	Inch.	0-10		Per cent	
New England.....	54.4	-0.1	-4.4	3.69	+0.30	-2.20	6.3	+0.8	74	-4
Middle Atlantic.....	63.6	+8.0	+7.9	3.40	-0.10	-1.50	5.4	+0.4	65	-7
South Atlantic.....	72.8	+3.0	+9.6	2.48	-1.30	-8.60	4.2	+0.2	68	-6
Florida Peninsula.....	77.0	-0.2	+1.3	3.46	-0.80	-5.90	5.1	+0.7	76	-4
East Gulf.....	74.5	+2.2	+6.7	5.04	+1.50	-7.00	3.6	-1.1	67	-0
West Gulf.....	73.4	+0.5	+8.7	4.27	+0.60	-1.80	4.5	-0.3	73	-2
Ohio Valley and Tennessee.....	66.7	+1.5	+1.8	3.93	+0.20	-0.90	5.4	+0.4	65	-3
Lower Lakes.....	57.0	-0.5	-2.9	4.14	+1.00	+1.60	5.9	+0.5	71	-0
Upper Lakes.....	52.6	-0.1	-2.7	3.61	+0.30	+1.20	6.1	+0.6	70	-2
North Dakota.....	51.7	-2.6	-13.5	2.20	-0.30	+0.20	5.3	-0.2	62	-0
Upper Mississippi Valley.....	62.0	-0.1	+0.4	4.49	+0.30	+0.90	5.8	+0.5	67	-1
Missouri Valley.....	61.7	-0.3	+0.2	4.18	0.00	-2.80	4.8	-0.2	65	-0
Northern slope.....	49.3	-3.7	-7.5	2.80	-0.10	-0.80	5.5	0.0	60	+2
Middle slope.....	62.8	-0.2	+1.6	2.33	-1.10	-1.90	4.4	-0.5	58	-3
Southern slope.....	71.4	+0.8	+13.3	1.54	-1.20	-2.00	3.1	-1.3	49	-8
Southern Plateau.....	64.5	-1.4	+2.4	0.10	-0.20	+1.60	1.6	-1.1	31	-1
Middle Plateau.....	53.5	-3.0	+1.9	0.60	-0.60	0.00	3.4	-0.7	38	-8
Northern Plateau.....	51.9	-5.0	-7.7	1.50	-1.20	+0.90	6.0	+0.9	58	+2
North Pacific.....	51.6	-2.3	-6.2	1.81	-0.40	-5.10	6.3	0.0	74	+2
Middle Pacific.....	56.1	-1.5	+3.3	0.38	-0.90	+0.10	2.9	-1.1	62	-9
South Pacific.....	60.7	-0.9	+3.9	0.02	-0.60	+4.60	2.8	-1.3	65	-4

WEATHER CONDITIONS ON THE NORTH ATLANTIC DURING MAY, 1916.

The data presented are for May, 1915, and comparison and study of the same should be in connection with those appearing in the REVIEW for that month. Chart IX (XLIV-63) herewith shows for May, 1915, the averages of pressure, temperature, and the prevailing direction of the wind at 7 a. m., 75th Meridian time, together with the locations and courses of the more severe storms of the month.

PRESSURE.

The distribution of the average pressure for the month, as shown on Chart IX, differed in many respects from the normal. The Azores HIGH, with a crest of 30.1 inches, was near its usual position and extended from the 22d to the 29th parallels and the 29th to the 58th meridians. No traces of the Icelandic LOW could be seen, and a HIGH with a crest of 30.1 inches was central near latitude 60° N., longitude 5° W. A LOW of 29.7 inches and of small extent was located with its center about three degrees east of St. Johns, Newfoundland, while there was no sign of the usual continental HIGH over the eastern districts of the United States. The pressure over the position normally occupied by this area was remarkably uniform, ranging from 29.9 to 30 inches. One of the most unusual features of the barometric distribution was the high pressure that prevailed over the northern portion of the ocean during the greater part of the month. The lowest individual barometric reading during the month in the region between the 60th and 65th parallels and the 15th and 20th meridians was 29.6 inches, occurring on May 3 and again on the 4th, while readings as high as 30.57 inches occurred in this region on May 8, and the average readings for the month in seven 5-degree squares varied from 30.04 to 30.11 inches.

The low pressure near St. Johns, Newfoundland, mentioned above, was remarkable for its tenacity, as it existed in that vicinity on 17 days during the month, the barometric readings ranging from 29.26 to 30.06 inches. In the extreme northeast portion of the ocean, the pressure was below the monthly mean on the first two days and from the 11th to the 17th, while it was above on the 9th and 10th and from the 18th to the 26th. In the waters adjacent to the American coast and in the vicinity of the Azores HIGH, the pressure was comparatively uniform, while in mid-ocean, north of the 40th parallel, it was considerably lower in the first two decades of the month than in the last.

GALES.

In the two 5-degree squares between the 40th and 45th parallels and the 35th and 45th meridians, the number of gales during the month was slightly above the normal, while in all other parts of the ocean the conditions were reversed, and along the northern sailing routes, winds of gale force were comparatively rare, as in the 5-degree square where the maximum number was reported they occurred on only three days.

Only two storm tracks for the month are shown on Chart IX (XLIV-63), although there were a number of disturbances reported whose tracks were either too irregular to plot accurately, or the positions of the centers indeterminate on account of lack of observations.

On May 2, a LOW of comparatively limited area was central near latitude 42° N., longitude 44° W., the lowest

barometric reading reported was 29.28 inches, and three vessels encountered winds of from 40 to 60 miles an hour. On the same day a second LOW of slight intensity covered a comparatively large area near Bermuda, while a third depression of slightly greater intensity and less extent than the second was located near latitude 42° N., longitude 25° W. Light to moderate winds circulated around these last two areas, and two vessels reported fog near the 40th parallel, between the 55th meridian and the American coast. From May 3 to 8 low-pressure areas were numerous over a large portion of the ocean, although they were shallow in character and not accompanied by heavy winds. From the 9th to the 11th the pressure over the ocean as a whole was above the normal, and no disturbances were recorded.

On May 12 a LOW (I on Chart IX) of 29.56 inches was located near St. Johns, Newfoundland; moderate winds, and fog prevailed near the center, while from 5 to 7 degrees south of that point winds of from 40 to 55 miles were encountered. This LOW moved in an easterly direction, and on the 13th was central near latitude 48° N., longitude 38° W., westerly and northwesterly gales of from 50 to 60 miles prevailing in the south and southwest quadrants. By the 14th this disturbance, which had remained practically stationary since the preceding day, had increased largely in extent, and a number of vessels a short distance to the south and southwest of the center reported gales of somewhat less force than on the day before. The storm then moved toward the northeast, and on the 15th the wind had moderated considerably, although the barometer had remained practically stationary. The disturbance then increased its rate of translation eastward, and on the 16th was near latitude 50° N., longitude 18° W.; the barometric readings were somewhat lower than on the 15th, although the winds were still moderate in force. It continued in its easterly course, and on May 17 the center was about 5 degrees west of the Scilly Islands, and while the winds near the center were from light to moderate, two vessels in the southwest quadrant reported gales of from 40 to 55 miles.

On May 18 a LOW (II on Chart IX) of 29.35 inches appeared near latitude 51° N., longitude 33° W. There were too few observations in the northern part of the area to determine the conditions accurately, although to the south and southwest of the center, winds of gale force extended to the 43d parallel and the 42d meridian. The LOW moved in an easterly direction and on the 19th, was located near latitude 51° N., longitude 26° W., where the barometer had fallen to 29.21 inches; the storm area had contracted somewhat since the 18th, and winds of gale force still prevailed in the southwest quadrant. The disturbance then curved toward the northeast and on the 20th was central near latitude 53° N., longitude 19° W. The barometer had risen somewhat since the 19th and the wind decreased in force; three vessels a short distance south of the center reported gales of from 40 to 48 miles, however. Between the 21st and 25th there were no disturbances of any importance reported, and the pressure was above the normal over nearly all the North Atlantic.

On May 26 a LOW of 29.66 inches appeared near latitude 40° N., longitude 49° W.; it was of limited extent and accompanied by light to moderate winds. By the 27th this "first" LOW had moved eastward to near latitude 42° N., longitude 43° W., the pressure and wind velocities

having remained practically constant since the day before. On May 27 a second LOW of 29.28 inches developed in the Gulf of St. Lawrence and moderate gales were reported by three vessels south of the center, near the 40th parallel. By the 28th the "first" LOW had disappeared and the "second" remained stationary in position and changed but little in intensity, while in the east and southeast quadrants light to moderate winds with fog prevailed. On the 29th this "second" depression was still in the same locality, although the barometric readings were somewhat higher than on the previous day and the winds were of less force.

On the 30th, the "second" LOW had moved a short distance toward the northeast and was central near latitude 50° N., longitude 54° W., while the barometer had fallen to 29.36 inches, without causing any appreciable increase in the velocity of the wind. The disturbance then moved in an easterly course and on the 31st was near latitude 50° N., longitude 43° W.; the pressure had risen to 29.45 inches and winds of gale force were reported from a small area east of the center.

TEMPERATURE.

North of the 45th parallel the average temperature for the month was slightly above the normal, except in the two 5-degree squares between the 50th and 55th parallels and the 10th and 20th meridians, where there was a negative departure of 1°. South of the 50th parallel and between the 40th meridian and the European coast the departures ranged between 0 and +4 degrees, while between the 40th and 70th meridians they varied from +3 to -3 degrees. In the waters adjacent to the American coast they were for the most part negative north of the 35th parallel, and positive south of that line, while in the Gulf of Mexico the temperatures were nearly normal.

The temperature departures for May, 1915, at a number of Canadian and United States Weather Bureau stations on the Atlantic and Gulf coasts were as follows:

St. Johns, N. F., -2.7°; Sydney, C. B. I., -0.8°; Halifax, N. S., -0.4°; Eastport, -0.3°; Portland, -1.3°; Nantucket, -0.4°; New York, -1.6°; Washington, -1.7°; Norfolk, -0.2°; Hatteras, +1.2°; Charleston, +3.1°; Key West, +1.1°; Pensacola, +1.0°; New Orleans, +2.9°; Galveston, +0.1°; Corpus Christi, -0.5°.

The lowest temperature reported during the month was 33° and occurred off the coast of Labrador on the 3d and again on the 20th. The highest temperature was 83°F. and was recorded on a number of days in the Caribbean Sea.

FOG.

During the period from 1901 to 1906, for the month of May, the average percentage of days with fog off the Banks of Newfoundland was from 40 to 45, while in the same region for May, 1915, it was observed on 10 days, a percentage of 32. In the waters adjacent to the American coast, north of the 35th parallel, the percentage ranged from 10 to 19, which was slightly below the normal. Over the central portion of the trans-Atlantic steamer routes no fog was reported, while over the eastern part the percentage ranged from 3 to 10.

PRECIPITATION.

Hail was reported on May 7, near latitude 62, longitude 12, and snow on the 25th, near latitude 47, longitude 50.

Maximum wind velocities, May, 1916.

(Velocities below 50 mis./hour (22.4 m./sec.) are not included here.)

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		<i>Mis./hr.</i>				<i>Mis./hr.</i>	
Ablene, Tex.....	26	52	s.	Green Bay, Wis ..	8	54	w.
Alpena, Mich.....	11	52	w.	Do.....	10	53	w.
Bismarck, N. Dak..	9	54	nw.	Helena, Mont.....	6	50	sw.
Buffalo, N. Y.....	1	56	w.	Houghton, Mich..	8	57	sw.
Do.....	10	72	sw.	Do.....	10	60	w.
Do.....	11	61	w.	Do.....	11	54	sw.
Canton, N. Y.....	11	56	nw.	Louisville, Ky.....	27	50	w.
Charlotte, N. C....	18	58	nw.	Marquette, Mich..	8	60	w.
Cheyenne, Wyo....	7	66	w.	Do.....	10	57	w.
Do.....	10	62	nw.	Do.....	11	50	w.
Do.....	22	58	w.	Memphis, Tenn....	30	72	nw.
Columbus, Ohio....	17	52	nw.	Modena, Utah.....	23	59	s.
Devils Lake, N.				Do.....	24	58	sw.
Dak.....	7	56	w.	Mobile, Ala.....	18	55	se.
Do.....	10	52	w.	Mount Tamalpais,			
Duluth, Minn.....	8	64	w.	Cal.....	5	70	sw.
Erie, Pa.....	10	60	sw.	Do.....	6	56	nw.
Do.....	11	52	sw.	Do.....	7	61	nw.
Evansville, Ind....	27	54	sw.	Do.....	9	72	nw.
Flagstaff, Ariz....	24	51	sw.	Do.....	16	56	nw.
Galveston, Tex....	18	59	n.	Do.....	18	50	nw.
Grand Forks, N.				Do.....	21	80	nw.
Dak.....	10	65	w.	Do.....	22	80	nw.

Maximum wind velocities, May, 1916—Continued.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		<i>Mis./hr.</i>				<i>Mis./hr.</i>	
Mount Tamalpais,				Point Reyes			
Cal.....	23	80	nw.	Light, Cal.....	24	59	nw.
Do.....	24	72	nw.	Do.....	29	64	nw.
Do.....	30	71	nw.	Do.....	30	68	nw.
Do.....	31	68	nw.	Do.....	31	50	nw.
North Head, Wash	5	58	s.	Pocatello, Idaho..	6	58	sw.
Do.....	7	74	se.	Port Huron, Mich.	11	50	w.
New York, N. Y....	9	58	nw.	Providence, R. I..	9	50	nw.
Do.....	12	63	nw.	Rapid City, S. Dak.	7	50	n.
Do.....	17	52	nw.	Reno, Nev.....	6	52	sw.
Do.....	25	54	w.	Saginaw, Mich.....	10	50	se.
Pierre, S. Dak.....	9	54	nw.	St. Louis, Mo.....	27	50	sw.
Do.....	10	55	nw.	St. Paul, Minn....	7	52	nw.
Point Reyes				Do.....	8	56	nw.
Light, Cal.....	9	72	nw.	Do.....	10	50	w.
Do.....	10	73	nw.	Do.....	31	62	se.
Do.....	11	62	nw.	Sand Key, Fla....	23	52	nw.
Do.....	12	50	nw.	Sault Ste. Marie,			
Do.....	16	53	nw.	Mich.....	8	52	nw.
Do.....	18	61	nw.	Do.....	11	53	w.
Do.....	19	73	nw.	Sheridan, Wyo....	9	50	nw.
Do.....	20	62	nw.	Tatoosh Island,			
Do.....	21	80	nw.	Wash.....	6	52	s.
Do.....	22	78	nw.	Do.....	7	50	s.
Do.....	23	68	nw.	Toledo, Ohio.....	10	63	sw.